

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1. (Previously presented) A fluid transport assembly comprising, in combination:
a pipeline for transporting a fluid along a fluid flow path extending in the pipeline; and
a pressure control device incorporated in the pipeline for regulating the pressure of the fluid downstream of the pressure control device to a predetermined pressure, which is independent of, and less than, the pressure prevailing in the pipeline upstream of the pressure control device;

wherein the pressure control device comprises:

a housing with an inflow opening and an outflow opening, wherein the fluid flow path of the pipeline extends in the housing between the inflow opening and the outflow opening, the inflow opening being in fluid connection with the pipeline upstream of the pressure control device;

a controllable seal for releasing and closing the fluid flow path in the housing;

a pressure sensor element accommodated in the housing for movement between a first and a second position, the pressure sensor element in the first position controlling the controllable seal to release the fluid flow path in the housing and in the second position controlling the controllable seal to close off the fluid flow path in the housing, the pressure sensor element on the one hand being exposed to the pressure prevailing in the fluid flow path downstream of the controllable seal, and on the other being exposed to a predetermined force, which in use, determines the predetermined pressure, wherein, in use, the pressure sensor element moves in the direction of the first position when the pressure prevailing in the fluid flow path downstream of the seal drops below the predetermined pressure determined by the

predetermined force and the pressure sensor element moves in the direction of the second position when the pressure prevailing in the fluid flow path downstream of the seal rises above the predetermined pressure determined by the predetermined force; and

a gas-tight chamber, characterized in that, the pressure sensor element comprises a plunger accommodated in the chamber for movement in an axial direction of the chamber between the first and the second position, the space enclosed by the plunger and the chamber (a) being filled with a gas for generating a first portion said predetermined force and (b) comprising a resilient element for generating a second portion of said predetermined force, the resilient element configured to urge the pressure sensor element toward the first position, the plunger being movable between the first and the second position in a direction parallel to the direction of the fluid flow path at the controllable seal and wherein the plunger is movable between the first and the second position in a direction from the inflow opening to the outflow opening, wherein the plunger moves in the direction of the first position if it moves in the direction of the inflow opening and the plunger moves in the direction of the second position if it moves in the direction of the outflow opening.

Claim 2. (Original) An assembly according to claim 1, wherein the plunger is movable between the first position and second position in a direction which is parallel to an axial direction of the pipeline at the pressure control device.

Claim 3. (Original) An assembly according to claim 1, wherein the controllable seal is movable in a direction parallel to the fluid flow path at the controllable seal.

Claim 4. (Original) An assembly according to claim 1, wherein the gas-tight chamber is manufactured from metal.

Claim 5. (Previously presented) An assembly according to claim 1, wherein the resilient element comprises a spring for generating at least a part of the second portion of said predetermined force, the spring being accommodated in the space enclosed by the plunger and the chamber and the spring pressing the plunger in the direction of the first position.

Claim 6. (Previously presented) An assembly according to claim 1, wherein the pressure control device comprises at least one ring-shaped sealing element and the controllable seal comprises (a) controllable sealing element configured to abut the ring-shaped sealing element when the controllable sealing element is in the second position and (b) a connecting element connecting the controllable sealing element and the plunger, the sealing element extending around the connecting element, the fluid flow path extending through the ring-shaped sealing element, the connecting element and the ring-shaped sealing element in the first position releasing the fluid flow path, and the connecting element and the ring-shaped sealing element in the second position closing the fluid flow path.

Claim 7. (Previously presented) An assembly according to claim 6, wherein the connecting element is movable between the first and second position in a direction which is parallel to the direction of the fluid flow path along the connecting element.

Claim 8. (Original) An assembly according to claim 1, wherein the gas pressure in the space is greater than an atmospheric pressure.

Claim 9. (Original) An assembly according to claim 1, wherein the pressure control device is provided with mounting means for mounting the pressure control device to the pipeline.

Claim 10. (Original) The pressure control device according to claim 9, wherein the mounting means comprises a bayonet fastener.

Claim 11. (Original) An assembly according to claim 1, wherein the outflow opening is in fluid connection with the pipeline downstream of the pressure control device so that the pipeline also extends downstream of the pressure control device.

Claim 12. (Original) An assembly according to claim 1, wherein the pressure control device forms the end of the pipe line.

Claim 13. (Previously presented) A pressure control device configured to receive a fluid from an upstream portion of a fluid flow path and expel fluid towards a downstream portion of said fluid flow path, the pressure control device further configured to regulate a pressure in the downstream portion of the fluid flow path to match a predetermined pressure which is independent of, and less than, a pressure prevailing in the upstream portion of the fluid flow path, the pressure control device comprising:

- a housing having an inlet and an outlet, the inlet being in fluid communication with the upstream portion of the fluid flow path and the outlet being in fluid communication with the downstream portion of the fluid flow path;

- a controllable seal positioned in the housing and in communication with the inlet, the controllable seal configured to release and close the fluid flow path through the housing; and

- a pressure sensor element accommodated in the housing and configured to move between a first position in which the pressure sensor element causes the controllable seal to release the fluid flow path in the housing, and a second position in which the pressure sensor element causes the controllable seal to close off the fluid flow path in the housing, wherein

- the pressure sensor element is exposed to a pressure prevailing in the fluid flow path downstream of the controllable seal, and is also exposed to a predetermined force which determines the predetermined pressure;

- the pressure sensor element is configured to:

- move in direction of the first position when the pressure prevailing in the fluid flow path downstream of the controllable seal drops below the predetermined pressure determined by the predetermined force; and

- move in a direction of the second position when the pressure prevailing in the fluid flow path downstream of the seal rises above the predetermined pressure determined by the predetermined force;

- the pressure sensor element comprises a plunger that is accommodated in a gas-tight chamber, a space enclosed between the plunger and the chamber (a) being filled with a gas for generating a first portion of said predetermined force and (b) comprising a resilient element for

generating a second portion of said predetermined force, the resilient element configured to urge the pressure sensor element toward the first position;

the plunger is arranged to move in an axial direction of the chamber between the first and the second position;

the plunger is movable between the first and the second position in a direction parallel to the direction of the fluid flow path at the controllable seal; and

the plunger is movable between the first and the second position in a direction from the inflow opening to the outflow opening, with the plunger moving in the direction of the first position when it moves in the direction of the inflow opening and the plunger moving in the direction of the second position when it moves in the direction of the outflow opening.

Claim 14. (Original) The pressure control device according to claim 13, wherein the plunger is movable between the first and second position in a direction that is parallel to an axial direction of the pipeline at the pressure control device.

Claim 15. (Original) The pressure control device according to claim 13, wherein the controllable seal is movable in a direction parallel to the direction of the fluid flow path at the controllable seal.

Claim 16. (Original) The pressure control device according to claim 13, wherein the gas-tight chamber is manufactured from metal.

Claim 17. (Previously presented) The pressure control device according to claim 13, wherein the resilient element comprises a spring for generating at least a part of the second portion of said predetermined force, the spring being accommodated in the space enclosed by the plunger and the chamber and the spring pressing the plunger in the direction of the first position.

Claim 18. (Previously presented) The pressure control device according to claim 13, wherein the pressure control device comprises at least one ring-shaped sealing element and the controllable seal comprises (a) controllable sealing element configured to abut the ring-shaped sealing element when the controllable sealing element is in the second position and (b) a

connecting element connecting the controllable sealing element and the plunger, the sealing element extending around the connecting element, the fluid flow path extending through the ring-shaped sealing element, the connecting element and the ring-shaped sealing element in the first position releasing the fluid flow path, and the connecting element and the ring-shaped sealing element in the second position closing the fluid flow path.

Claim 19. (Previously presented) The pressure control device according to claim 13, wherein the connecting element is movable between the first and second position in a direction which is parallel to the direction of the fluid flow path along the connecting element.

Claim 20. (Original) The pressure control device according to claim 13, wherein the gas pressure in the space is greater than an atmospheric pressure.

Claim 21. (Original) The pressure control device according to claim 13, wherein the pressure control device is further provided with mounting means for mounting the pressure control device onto a pipeline.

Claim 22. (Original) The pressure control device according to claim 21, wherein the mounting means comprises a bayonet fastener.

Claim 23. (Previously presented) A pressure control device arranged to be mounted to a pipeline which pipe line is arranged for transporting a fluid along a fluid flow path extending in the pipeline, wherein the pressure control device is arranged for regulating the pressure of the fluid downstream the pressure control device to a predetermined pressure which is independent of, and less than, the pressure prevailing in the pipeline upstream of the pressure control device, wherein the pressure control comprises a housing provided with an inflow opening and an outflow opening wherein, in use, the fluid flow path of the pipeline extends in the housing between the inflow opening and the outflow opening and the inflow opening being in fluid connection with the pipeline upstream of the pressure control device, the pressure control device further comprising a controllable seal for releasing and closing the fluid flow path in the housing and a pressure sensor element accommodated in the housing for movement between a first and a

second position, the pressure sensor element in the first position controlling the controllable seal to release the fluid flow path in the housing and in the second position controlling the controllable seal to close off the fluid flow path in the housing, the pressure sensor element on the one hand being exposed to the pressure prevailing in the fluid flow path downstream of the controllable seal, and on the other being exposed to a predetermined force which, in use, determines the predetermined pressure, wherein, in use, the pressure sensor element moves in the direction of the first position when the pressure prevailing in the fluid flow path downstream of the seal drops below the predetermined pressure determined by the predetermined force and the pressure sensor element moves in the direction of the second position when the pressure prevailing in the fluid flow path downstream of the seal rises above the predetermined pressure determined by the predetermined force wherein the pressure control device comprises a gas-tight chamber, characterized in that, the pressure sensor element comprises a plunger accommodated in the chamber for movement in an axial direction of the chamber between the first and the second position, the space enclosed by the plunger and the chamber (a) being filled with a gas for generating a first portion of said predetermined force and (b) comprising a resilient element for generating a second portion of said predetermined force, the resilient element configured to urge the pressure sensor element toward the first position, the plunger being movable between the first and the second position in a direction parallel to the direction of the fluid flow path at the controllable seal, wherein the plunger is movable between the first and the second position in a direction parallel to a direction from the inflow opening to the outflow opening, wherein the plunger moves in the direction of the first position if it moves in the direction of the inflow opening and the plunger moves in the direction of the second position if it moves in the direction of the outflow opening.

Claim 24. (Previously presented) A method for regulating a pressure of a fluid which is transported along a fluid flow path extending through a pipeline, the method comprising the step of:

incorporating into the pipeline, a pressure control device for regulating the pressure of the fluid downstream from the pressure control device to a predetermined pressure which is

independent of, and less than, the pressure prevailing in the pipeline upstream of the pressure control device,

wherein the pressure control device comprises a housing provided with an inflow opening and an outflow opening, wherein, in use, the fluid flow path of the pipeline extends in the housing between the inflow opening and the outflow opening wherein, in use, the inflow opening being in fluid connection with the pipeline upstream of the pressure control device;

the pressure control device further comprising a controllable seal for releasing and closing the fluid flow path in the housing and a pressure sensor element accommodated in the housing for movement between a first and a second position, the pressure sensor element in the first position controlling the controllable seal to release the fluid flow path in the housing and in the second position controlling the controllable seal to close off the fluid flow path in the housing, the pressure sensor element on the one hand being exposed to the pressure prevailing in the fluid flow path downstream of the controllable seal, and on the other being exposed to a predetermined force which, in use, determines the predetermined pressure, wherein, in use, the pressure sensor element moves in the direction of the first position when the pressure prevailing in the fluid flow path downstream of the controllable seal drops below the predetermined pressure determined by the predetermined force and the pressure sensor element moves in the direction of the second position when the pressure prevailing in the fluid flow path downstream of the seal rises above the predetermined pressure determined by the predetermined force wherein the pressure control device comprises a gas-tight chamber; and wherein,

the pressure sensor element comprises a plunger accommodated in the chamber for movement in an axial direction of the chamber between the first and the second position, the space enclosed by the plunger and the chamber (a) being filled with a gas for generating said predetermined force and (b) comprising a resilient element for generating a second portion of said predetermined force, the resilient element configured to urge the pressure sensor element toward the first position, the plunger being movable between the first and the second position in a direction which is parallel to the direction of the fluid flow path at the controllable seal, wherein, in use, the plunger is movable between the first and the second position in a direction

which is parallel to a direction from the inflow opening to the outflow opening, wherein the plunger moves in the direction of the first position when it moves in the direction of the inflow opening and the plunger moves in the direction of the second position when it moves in the direction of the outflow opening.

Claim 25. (Original) The method according to claim 24, wherein the plunger moves between the first and second position in a direction which is parallel to an axial direction of the pipeline at the pressure control device.

Claim 26. (Original) The method according to claim 24, wherein the controllable seal is movable in a direction parallel to the fluid flow path at the controllable seal.

Claim 27. (Original) The method according to claim 24, wherein the gas-tight chamber is manufactured from metal.

Claim 28. (Previously presented) The method according to claim 24, wherein the resilient member comprises a spring for generating at least a part of the second portion of said predetermined force, the spring being accommodated in the space enclosed by the plunger and the chamber and the spring pressing the plunger in the direction of the first position.

Claim 29. (Previously presented) The method according to claim 24, wherein the pressure control device comprises at least one ring-shaped sealing element and the controllable seal comprises (a) controllable sealing element configured to abut the ring-shaped sealing element when the controllable sealing element is in the second position and (b) a connecting element connecting the controllable sealing element and the plunger, the sealing element extending around the connecting element, the fluid flow path extending through the ring-shaped sealing element, the connecting element and the ring-shaped sealing element in the first position releasing the fluid flow path, and the connecting element and the ring-shaped sealing element in the second position closing the fluid flow path.

Claim 30. (Previously presented) The method according to claim 29, wherein the connecting element is movable between the first and second position in a direction which is parallel to the direction of the fluid flow path along the connecting element.

Claim 31. (Original) The method according to claim 24, wherein the gas pressure in the space is greater than an atmospheric pressure.

Claim 32. (Original) The method according to claim 24, wherein the pressure control device forms the end of the pipe line.

Claim 33. (Original) The method according to claim 24, wherein the pressure control device is used such that the outflow opening is in fluid connection with the pipeline downstream of the pressure control device so that, in use, the pipeline also extends downstream the pressure control device.

Claim 34. (Previously presented) A pressure control device configured to provide passage of fluid between upstream and downstream portions of a fluid flow path, the pressure control device comprising:

- an inlet;

- an outlet;

- a pressure-regulating control device disposed along a fluid path extending between the inlet and the outlet, the pressure-regulating control device comprising:

- a sealed chamber comprising an enclosed fluid having a first pressure;

- a resilient element disposed within the sealed chamber;

- a valve disposed along the fluid path, the valve being movable between a first position obstructing passage of fluid along the fluid path from the inlet to the outlet and a second position allowing fluid to pass along the fluid path from the inlet to the outlet; and

- wherein a pressure of fluid present along the fluid path downstream of the valve urges the valve toward the first position and (a) the first pressure of the enclosed fluid present within the sealed chamber and (b) the resilient element each urge the valve toward the second position.

Claim 35. (New) A pressure regulator,
comprising:

a housing defining a fluid path having an inlet and an outlet, fluid
within the fluid path having a first pressure;

a valve movable between a closed state obstructing the inlet and an
open state allowing fluid to enter the fluid path; and

a sealed chamber enclosing a fluid having a second pressure, the sealed chamber
comprising a movable wall connected to the valve for regulating the pressure in the fluid path
based only on a difference between the first and second pressures, the movable wall being
movable to a first position in which the valve is in the closed state and to a second position in
which the valve is in the open state, wherein the movable wall (a) moves to the first position
when the first pressure exceeds the second pressure and (b) moves to the second position when
the second pressure exceeds the first pressure.

Claim 36. (New) A pressure regulator, comprising:

a housing defining a fluid path having an inlet and an outlet, fluid
within the fluid path having a first pressure;

a valve movable between a closed state obstructing the inlet and an open state allowing
fluid to enter the fluid path; and

a sealed chamber comprising a movable wall movable along an axis and enclosing a fluid
having a second pressure, the movable wall connected to the valve and movable to a first
position in which the valve is in the closed state and to a second position in which the valve is in
the open state, the position of the movable wall with respect to the housing being determined by
a sum of axial forces resulting from the first and second pressures acting upon the movable wall,
the sum of axial forces in the closed state and in the open state being the same, wherein the
movable wall (a) moves to the first position when the first pressure exceeds the second pressure
and (b) moves to the second position when the second pressure exceeds the first pressure.